

FINAL
7N-90-CR1
OCT
45517

FINAL REPORT NAG 5-1231

THE FAR IR LUMINOSITY OF MOLECULAR CLOUDS AND
THE GALACTIC INTERSTELLAR RADIATION FIELDPhilip Solomon, Principal Investigator
State University of New York at Stony Brook
Stony Brook, NY 11794-2100

We have determined the infrared surface brightness of about 85 interstellar molecular clouds. For each cloud, the IRAS images were re-examined and carefully compared with our CO survey data. Substantial effort was devoted to using only well isolated or clear features. About 30 new clouds, most in the outer galaxy, have been added to our study. These are particularly important since they permit a much better determination of the intensity of the interstellar radiation field, ISRF. The results indicate a galactic ISRF falling off exponentially from $0.5 R_{\odot}$ to $1.5 R_{\odot}$. There is surprisingly good agreement with the predictions from galactic models.

An important by-product of this investigation has been a new analysis of the relationship between cloud size and linewidth. The new analysis show a much tighter correlation between these parameters, and demonstrates the presence of a third important parameter related to the filling factor of material along the line of site through a cloud. This has been achieved by a careful analysis of only those clouds with well determined parameters. This evidence supports the idea that the clouds are in or near virial equilibrium.

As a result of this work, extensive new observations of dust continuum sources have been made at 1.2 mm wavelength locating the cores in a dozen molecular clouds.

There are no inventions to report as a result of this project.

(NASA-CR-198005) THE FAR IR
LUMINOSITY OF MOLECULAR CLOUDS AND
THE GALACTIC INTERSTELLAR RADIATION
FIELD Final Report (State Univ. of
New York) 1 p

N95-71120

Unclass

29/90 0045517